

WE CLAIM:

- 1 1. A process for the preparation of an alkanediol,
2 which process comprises:
3 (a) contacting an alkylene oxide with carbon dioxide
4 in the presence of a catalyst to obtain a first
5 liquid reaction mixture containing a cyclic
6 carbonate;
7 (b) optionally removing carbon dioxide and/or
8 alkylene oxide;
9 (c) increasing the pressure of the liquid reaction
10 mixture obtained in step (a) and/or (b);
11 (d) contacting the pressurized first reaction mixture
12 obtained in step (c) with water in the presence of
13 catalyst to obtain a second reaction mixture
14 containing alkanediol and carbon dioxide;
15 (e) separating the second reaction mixture into a
16 liquid effluent and a gaseous effluent containing
17 carbon dioxide; and,
18 (f) recycling at least part of the gaseous effluent
19 containing carbon dioxide to step (a),
20 in which process the pressure in step (d) is higher
21 than the pressure in step (a).
1 2. The process of claim 1, wherein step (d) is
2 carried out at a pressure of from 5 to
3 $50 \times 10^5 \text{ N/m}^2$.
1 3. The process of claim 2, wherein step (a) is
2 carried out at a pressure of from 3 to
3 $40 \times 10^5 \text{ N/m}^2$.
1 4. The process of claim 2, wherein the pressure in
2 step (d) is at least $0.1 \times 10^5 \text{ N/m}^2$ higher than
3 the pressure in step (a).
1 5. The process of claim 2, wherein step (a) is
2 carried out with a homogeneous catalyst and step
3 (d) is carried out with a heterogeneous catalyst.

- 1 6. The process of claim 2, wherein the gaseous
2 effluent obtained in step (e) is recycled
3 directly to step (a), optionally after having
4 been combined with fresh carbon dioxide.
- 1 7. The process of claim 2, which process further
2 comprises separating alkanediol from the second
3 reaction mixture.
- 1 8. The process of claim 2, which process further
2 comprises:
3 (g) separating the liquid effluent obtained in step
4 (e) further into a gaseous effluent rich in carbon
5 dioxide and a liquid effluent;
6 (h) contacting with water the gaseous effluent rich
7 in carbon dioxide obtained in step (g); and,
8 (i) sending the water used in step (h) to step (d).
- 1 9. The process of claim 8, which process further
2 comprises separating alkanediol from the liquid
3 effluent obtained in step (g).
- 1 10. The process of claim 1, wherein step (a) is
2 carried out at a pressure of from 3 to
3 $40 \times 10^5 \text{ N/m}^2$.
- 1 11. The process of claim 1, wherein the pressure in
2 step (d) is at least $0.1 \times 10^5 \text{ N/m}^2$ higher than
3 the pressure in step (a).
- 1 12. The process of claim 1, wherein step (a) is
2 carried out with a homogeneous catalyst and step
3 (d) is carried out with a heterogeneous catalyst.
- 1 13. The process of claim 1, wherein the gaseous
2 effluent obtained in step (e) is recycled
3 directly to step (a), optionally after having
4 been combined with fresh carbon dioxide.
- 1 14. The process of claim 1, which process further
2 comprises separating alkanediol from the second
3 reaction mixture.

- 1 15. The process of claim 1, which process further
2 comprises:
3 a. separating the liquid effluent obtained in
4 step (e) further into a gaseous effluent rich
5 in carbon dioxide and a liquid effluent;
6 b. contacting with water the gaseous effluent
7 rich in carbon dioxide obtained in step (g);
8 and,
9 c. sending the water used in step (h) to step
10 (d).
1 16. The process of claim 15, which process further
2 comprises separating alkanediol from the liquid
3 effluent obtained in step (g).